

Page 4 (2nd Paragraph Amended) Figs. 3B-1 and 3B-2 are functional block diagrams of the browser in the second embodiment, where a compressed image file of interlaced format is decompressed, thereby progressively producing images received from the second computer.

Page 4 (Amended 6th Paragraph) Figs. 5B-1 and 5B-2 are network sequence diagrams for the network shown in Fig. 4B.

Page 4 (11th Paragraph Amended) Figs. 11A-1 and 11A-2 are functional block diagrams of the server 110 corresponding to the server process shown in the flow diagram of Fig. 10.

Page 9 (3rd Paragraph Amended) The first user computer 10 includes the control program 20 and second computer 10' includes control program 20', both of which are shown in the network sequence diagram of Fig. 2B-1. The control program 20 in Fig. 2B-1 begins in step 202 with the exchange of hand shake signals including a local public key of the first user computer 10, which is transmitted to the second computer 10'. The first computer 10 includes a public key/private key program 40 which is used to generate the enable message 28 to be sent to the second computer 10'. The public key/private key program 40 uses the first user's private key to sign the enable message 28 uniquely identifying the enable message 28 as being received from the first user computer 10. The second user computer 10' includes a public key/private key program 40' which uses the first users public key to verify that the enable message 28' was properly signed by the first user's private key. The enable message 28 is then used at the second user computer 10' to pass from step 202' to 204'. Correspondingly, the enable message 28' sent

from the second user computer 10' to the first computer 10 is signed by the public key/private key program 40' in the second computer 10' using the private key of the second user. The enable message 28' received at the first user computer 10' is verified by the public key/private key program 40 in the first computer 10 applying the public key of the second user to verify that the second user signed the enabled message 28' with the second user's private key. The enable message 28' then enables the control program 20 in the first computer 10 to flow from step 202 to step 204. Public key cryptography is described, for example, in the book by Richard E. Smith entitled, "Internet Cryptography", published by Addison-Wesley, 1997.

Page 10 (2nd Paragraph Amended) In step 204 of Fig. 2B-1, the first computer 10 sends the compressed image F in message 24 which, in this example, is an interlaced GIF file, to the second computer 10' for display in step 210'. Correspondingly, the second computer 10' sends the compressed image S in message 24', which in this example, is an interlaced GIF file, to the first computer 10 for display in step 210. In the control program 20, step 204 then flows to step 206 which detects the local and remote mouse down states and in the control program 20', step 206' detects the local and remote mouse down states, then step 206 passes a mouse down message 26 to the second computer 10'. As long as both mouse buttons are pressed on both respective computers 10 and 10', step 206 flows to step 208 and step 206' flows to step 208'. In step 208, the first stage enable message signed with a local private key, as previously explained, is sent from the first computer 10 to the second computer 10'. Correspondingly, the step 208' in the second computer 10' sends the first stage enable message 28' signed with a local private key to the first computer 10. As shown in Figs. 2B-1 and 2B-2 step 208 flows to step 210 in the first

computer 10, wherein the interlaced GIF image S is decoded in a first pass as the stage 1 picture S1 shown in Fig. 1B. Correspondingly, in second computer 10', the interlaced GIF message F is decoded in a first pass as the stage 1 picture F1, which the browser 30' displays as shown in Fig. 1B.

Page 11 (2nd Paragraph Amended) Reference can now be made to Figs. 3B-1 and 3B-2 which illustrate a GIF compressed image file S in the interlaced format being progressively decompressed in consecutive stages which can be locally controlled. Fig. 3B-1 shows the first user computer 10 in which the browser 30 in the computer 10 has received and is to display the interlaced GIF file S having the file structure 300. The interlaced GIF file structure 300, in this example, is a GIF 89A type file structure which is described in greater detail in the book by James D. Murray, et al., entitled "Graphics File Formats", 2nd Edition, published by O'Reilly and Associates, 1996. The interlaced GIF file structure 300 includes the GIF 89A header 302 which is a small 6 byte character block containing the GIF version of the file. Also included in the file structure 300 is the local screen descriptor 304 which defines an area of pixels for the GIF image on the user's display. The control block 306 of the file structure 300 provides for user input options. Normally, when an interlaced GIF file is received by the browser 30, the GIF file is immediately rendered on the screen. However, if a user-input signal is required, as specified in the control block 306, the image rendering must wait until the next stage enable message 28' is received from the second user computer 10'. The control program 20 establishes what is to be considered as a user input signal. The image block 308 of the file structure 300 includes the requirement that the image must be interlaced. Interlacing is a way of saving and displaying the

image data. For interlacing to occur, the image must be initially saved in the interlaced format when the image is created. Interlacing saves alternate rows, producing a venetian blind or block-focusing effect, depending upon the browser's handling of interlacing. Interlacing stores the rows of the image in the order as follows:

Page 12 (2nd Paragraph Amended) Reference is made to Fig. 3B-2 which shows stage 1 for picture S1, stage 2 for picture S2, stage 3 for picture S3, and stage 4 for picture S4. These stages correspond to the progressively more detailed display of the compressed image S with each pass of the browser 30 through the loop provided from the image block 308 to the control block 306 of the GIF file structure 300. The flow from the control block 306 to the image block 308 can only be accomplished when a next stage enable message 28' is received from the second user computer 10'. The GIF file structure of 300 of Fig. 3B-1 concludes with a trailer 310 as shown in Fig. 3B-2. Other progressive or interlaced image compression file formats can be used as discussed above including JPEG, JBIG, and PNG, all of which are discussed in the above-cited James D. Murray, et al., book.

Page 12 (3rd Paragraph Amended) Referring back to Fig. 2B-2, the step 212 of the control program 20 periodically detects the local and remote mouse down states for the first program 20, and correspondingly step 212' periodically detects local and remote mouse down states for the program 20'. If the first and second users continue to be interested in viewing progressively more detailed images which are decompressed from the compressed images F and S, then they continue to hold down their respective mouse buttons (or keyboard key depression,

as appropriate). Step 212 then flows to step 214 and if both mouse down states exist, then control program 20 sends the next stage enable message to the computer 10'. As detailed above, enable message 28 is signed with the private key of the first user at computer 10 and is sent to the second user computer 10' to enable the browser 30' and the second computer 10' to produce the stage 2 picture F2. Step 214 of the control program 20' correspondingly determines that if both mouse buttons are down, the next stage enable message 28' is sent from the second user computer 10' to the first user computer 10. Enable message 28' is signed by the private key of the user at the second computer 10'. When the enable message 28' is received at the first computer 10 as previously discussed, the next stage picture S2 will be decoded from the compressed file structure 300 in Fig. 3B-1 and displayed to the first user in computer 10. Step 216 in the control program 20 decodes and displays the next stage decompressed image from compressed GIF image S from the remote computer. Correspondingly, step 216' in the control program 20' decodes and displays the next stage decompressed image from compressed GIF image F from the remote computer 10. Step 216 loops back to step 212 in the control program 20 to consecutively decode and display the pictures S2, S3, and S4 from the compressed image S as long as both mouse buttons are down. Similarly, step 216' loops back to step 212' in control program 20' to progressively decode and display the next pass interlace GIF image for the picture F2, F3, and F4 for the progressively decoded GIF file structure for the compressed image F received in the second computer 10'.

Page 13 (2nd Paragraph Amended) Fig. 4B is a network diagram illustrating that the peer to peer relationship between the first computer 10 and the second computer 10' is established by

the mailbox/chatroom application 1146 in the server 110, which functions as a chat room mailbox. Figs. 5B-1 and 5B-2 are network session diagrams illustrating the messages shown in Figs. 2B-1 and 2B-2, which pass through the server 110 in the network diagram of Fig. 4B.

Page 13 (Last Paragraph Amended) The browser program 30 in computer 10 and the browser program 30' in computer 10' can be, for example, a Microsoft Internet Explorer 5 browser, which is capable of being programmed to perform functions such as described for the handling of the GIF 89A file structure 300 in Fig. 3B-1. Reference is made to the book by Scott Roberts, entitled "Programming Microsoft Internet Explorer 5," Microsoft Press, 1999, for extensive discussion of how to customize the functions of the browsers 30 and 30' to conform with the functions described in connection with Figs. 3B-1 and 3B-2. Other browsers can be used as browser 30 and/or 30', for example, the Netscape Navigator browser, and many other browsers which are available, for example, Hot Java by Sun Microsystems, and Web Explorer by IBM Corporation.

Page 18 (2nd Paragraph Amended) Table 2 shows an example DTD "resume.dtd" that is in the "SYSTEM" directory of the employer's second computer 10' as shown in the following Table 2. The example XML Document For An Employment Resume of Table 1 is sent by the job applicant at the first computer 10 to the employer at the second computer 10', where the Example DTD "resume.dtd" in Table 2 validates each of the document elements of the XML document in Table 1 and groups them into the progressive stages that are passed to the control program 20C' in the second computer 10'. Following the job applicant's computer 10

handshake step 222 of Figure 2C-1, step 224 sends the XML document 23 and the DTD for the resume to the employer's computer 10'. Step 226 detects the mouse down states. The employer's computer performs similar steps 222', 224', and 226', sending the XML document 23' and the DTD for the job description.

Page 19 (2nd Paragraph Amended) The prospective employer's computer 10' will receive the XML document from the job applicant's first computer 10, and will pass it to the XML processor / parser 27'. The XML processor / parser 27' interprets the XML tags and elements in the XML document and organizes the tagged parts into progressive stages for presentation to the user, in accordance with the definition of those stages in the DTD identified for that document. The group stages are passed to the control program 20C' in the second computer 10' that progressively presents each stage to the prospective employer, using the process described in the flow diagram of Figures 2C-1 and 2C-2.

Page 19 (3rd Paragraph Amended) Figures 2C-1 and 2C-2 show the job applicant's computer 10 sending an enable message in step 228, displaying the first pass decoded text for stage 1 in step 230, periodically detecting mouse down states in step 232 and sending the next stage enable message in step 234. Step 236 loops to repeatedly decode and display the next stages. The employer's computer 10' performs similar steps at 232', 234', and 236'.

Page 20 (2nd to last Paragraph Amended) Note that the order of occurrence of the elements in the XML document is not important, since the DTD will sort the elements by

progressive stages, as they are defined in the DTD. Also note that there are five progressive stages defined by the DTD. There can be as many stages as needed to convey the desired information, since the control program 20C' shown in the flow diagram of Figures 2C-1 and 2C-2 keep looping to the next stage until there are no more stages to present, or until one of the mouse-down signals turns off.

Page 23 (2nd Paragraph Amended) The job applicant's first computer 10 will receive the XML document from the employer's second computer 10', and will pass it to the XML processor / parser 27. The XML processor / parser 27 interprets the XML tags and elements in the XML document and organizes the tagged parts into progressive stages for presentation to the job applicant, in accordance with the definition of those stages in the DTD identified for that document. The grouped stages are passed to the control program 20C that progressively presents each stage to the job applicant, using the process described in the flow diagrams of Figures 2C-1 and 2C-2.

Page 24 (2nd to last Paragraph Amended) Note that the order of occurrence of the elements in the XML document is not important, since the DTD will sort the elements by progressive stages, as they are defined in the DTD. Also note that there are five progressive stages defined by the DTD. There can be as many stages as needed to convey the desired information, since the control program 20C shown in the flow diagrams of Figures 2C-1 and 2C-2 keep looping to the next stage until there are no more stages to present, or until the mouse-down signal turns off. However, the number of stages in the job applicant's resume document of

Table 1 should be the same as number of stages in the prospective employer's job description document of Table 3, in order that each party will receive progressive information at each stage of the transaction.

Page 29 (Last Paragraph Amended) Figures 11A-1 and 11A-2 are functional block diagrams of the server 110, showing the memory 1102 of the server 110 storing components of software program objects needed to perform the operations of handling customized discounts and payment plans and handling digital coupons. The memory 1102 of the server 110 is connected by the system bus 1104 to the central processor 1110 that executes the programmed instructions stored in the memory 1102. Bus 1104 is also connected to the merchant's database 800 and 900. The TCP/IP network adapter 1106 is connected by the bus 1104 to the memory 1102, for connecting the server 110 to the first and second computers 10 and 10'. The banking network adapter 1112 is connected by the bus 1104 to the memory 1102, for connecting the server 110 to a private banking network and banking servers which can be used by the server 110 to check credit histories and to arrange for credit card, debit card, or E-Cash payments by the user. The central processor 1110 can be, for example, an IBM RS/6000 Enterprise Server, an IBM AS/400e Server, or the like.

Page 30 (Last Paragraph Amended) Figures 11A-1 and 11A-2 show the various functional modules of the server 110 arranged in an object model. The object model groups the various object-oriented software programs into components which perform the major functions and applications in the server 110. Enterprise Java Beans (EJB) is a software component

architecture for servers, which is suitable for embodying the object-oriented software program components of Figures 11A-1 and 11A-2. A description of E-Commerce server programming applications developed with Enterprise Java Beans is provided in the book by Ed Roman entitled "Mastering Enterprise Java Beans", published by John Wiley and Sons, 1999. A description of the use of an object model in the design of a web server for E-Commerce applications is provided in the book by Matthew Reynolds entitled "Beginning E-Commerce", Wrox Press Inc, 2000, (ISBN: 1861003986). The components of object-oriented software programs in the object model of memory 1102 are organized into a business logic tier 1114, a presentation tier 1115, and an infrastructure objects partition 1122. The business logic tier 1114 is further divided into two partitions: an application services objects partition 1124 and a data objects partition 1126. The infrastructure objects partition 1122 includes an object-oriented software program component for the database server interface 1130, an object-oriented software program component for the system administrator interface 1132, and the operating system 1125. The operating system 1125 can be, for example, IBM AIX, IBM OS/400, IBM OS/390, Microsoft Windows NT, Red Hat Linux, or Caldera Linux.

Page 31 (First Paragraph Amended) Figures 11A-1 and 11A-2 show the presentation tier 1115 including a TCP/IP interface 1120 and a bank interface 1125. The presentation tier 1115 manages the graphical user interface with the user. A suitable implementation for the presentation tier 1115 is with Java servlets to interact with the user using the hypertext transfer protocol (HTTP). The Java servlets run within a request/response server, handling request messages from the user and returning response messages to the user. The Java servlet is a Java

object that takes a request as input, parses its data, performs some logic, and then issues a response back to the user. The Java servlets are pooled and reused to service many user requests. The TCP/IP interface 1120, implemented with Java servlets, functions as a web server that communicates with the users using the HTTP protocol. The TCP/IP interface 1120 accepts HTTP requests from the user and passes the information in the request to the visit object 1128 in the business logic tier 1114. Result information returned from the business logic tier 1114 is passed by the visit object 1128 to the TCP/IP interface 1120, which sends the results back to the user in an HTTP response. The TCP/IP interface 1120 exchanges data through the TCI/IP network adapter 1106 of server 110 with the first and second users' computers 10 and 10'. Java servlets and the development of web site servers is described in the book by Duane K. Fields, et al. entitled "Web Development with Java Server Pages", published by Manning Publications Co., 2000.

Page 31 (Last Paragraph Amended) The business logic tier 1114 in Figure 11A-1 includes multiple instances of the visit object 1128, 1128', and 1128''. Each user's computer 10 and 10' that sends a message to the server 110 has a temporary and separate visit object 1128 instantiated to represent the visit. The Enterprise Java Bean server can instantiate multiple copies of the visit object component 1128 in the business logic tier 1114 to handle multiple messages from multiple users. Each visit object 1128 will buffer user-specific information and maintain a user-specific state for the duration of the session with the user. Each visit object 1128 is a "stateful session bean" that will hold the conversational state about the user's visit. A stateful session bean is an Enterprise Java Bean that services business processes that span

multiple method requests or transactions. The stateful session bean retains state on behalf of an individual user. Data received by the server from the user and data sent by the server to the user will be temporarily buffered in the visit object 1128. Each visit object 1128 receives from the interface 1120 the user data sent by the user's computer 10 or 10' to the server 110 in step 1101 of Figure 11B. Each visit object 1128 will also buffer the resulting information that is computed by the server and is passed back to the TCP/IP interface 1120.

Page 32 (2nd Paragraph Amended) Figure 11B shows the allocation of a given request by the visit object 1128 to the various application programs 1140 to 1148 in Figures 11A-1 and 11A-2, depending on the nature of the request to the server. The visit object method 1128 receives the user's request in step 1101 and determines in step 1103 whether so an interest-matching request. If so, then step 1105 sends a method call to the interest matching application 1140 in Figure 11A-1. If not, then the method flows to step 1107. The visit object method 1128 determines in step 1107 whether the server has received a server control request. If so, then step 1109 sends a method call to the control program application 1142 in Figure 11A-1. If not, then the method flows to step 1111. The visit object method 1128 determines in step 1111 whether the server has received an auction request. If so, then step 1113 sends a method call to the auction application 1144 in Figure 11A-2. If not, then the method flows to step 1117. The visit object method 1128 determines in step 1117 whether the server has received a peer-to-peer mailbox request. If so, then step 1119 sends a method call to the mailbox/chatroom application 1146 in Figure 11A-2. If not, then the method flows to step 1121. The visit object method 1128 determines in step 1121 whether the server has received a payment request. If so, then step 1121

sends a method call to the payment application **1148** in Figure 11A-2. If not, then the method flows to step **1127**, which sends the request to a parser for additional processing.